

 MONTANA DEPARTMENT
OF TRANSPORTATION  MONTANA
CADD



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BARS (ALL DIMENSIONS ARE OUT TO OUT)

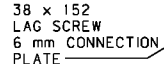
BENT BARS (ALL DIMENSIONS ARE OUT TO OUT)



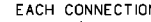
6050 CATTLE GUARD (6.0 m RDWY.)					9050 CATTLE GUARD (9.0 m RDWY.)				
MARK	SIZE	NO.	TYPE	LENGTH	MARK	SIZE	NO.	TYPE	LENGTH
B1	#13	12	STR.	5930	B1	#13	12	STR.	8930
B2	#13	28	1	1940	B2	#13	42	1	1940
B3	#13	6	STR.	2280	B3	#13	12	STR.	2280
B4	#13	4	2	1640	B4	#13	8	2	1640
B5	#13	6	3	3180	B5	#13	6	3	3180
ESTIMATED WT. = 163.8 kg					ESTIMATED WT. = 246.7 kg				
7250 CATTLE GUARD (7.2 m RDWY.)					10 850 CATTLE GUARD (10.8 m RDWY.)				
B1	#13	12	STR.	7130	B1	#13	12	STR.	10730
B2	#13	34	1	1940	B2	#13	50	1	1940
B3	#13	6	STR.	2280	B3	#13	12	STR.	2280
B4	#13	4	2	1640	B4	#13	8	2	1640
B5	#13	6	3	3180	B5	#13	6	3	3180
ESTIMATED WT. = 189.7 kg					ESTIMATED WT. = 283.6 kg				

ESTIMATED CLASS "A" CONC. QUANTITIES

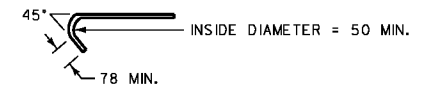
6	050	CATTLE	GUARD	=	4.8	m ³
7	250	CATTLE	GUARD	=	5.6	m ³
9	050	CATTLE	GUARD	=	7.4	m ³
10	850	CATTLE	GUARD	=	8.9	m ³



38 x 152
LAG SCREW
6 mm CONNECTION
PLATE



STEEL WING CONNECTION DETAILS

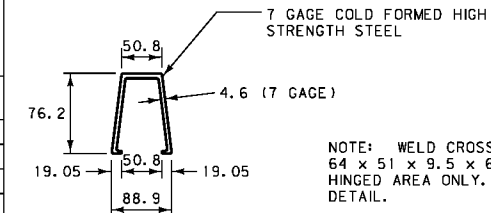


(TYPES 1 AND 2)



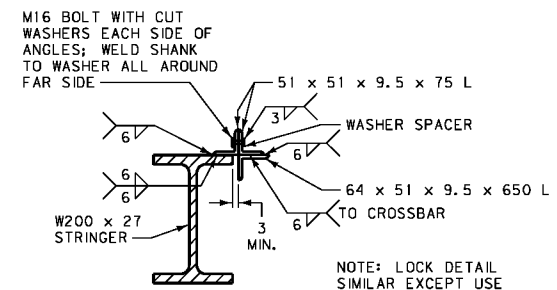
STRAIGHT BARS

REBAR DETAILS



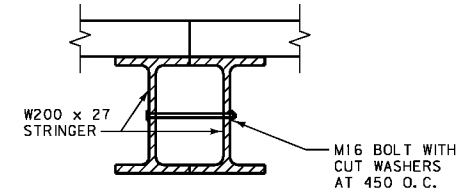
NOTE: WELD CROSSBARS TO
64 x 51 x 9.5 x 650 ANGLES
HINGED AREA ONLY. SEE HINGE
DETAIL.

CROSSBAR



NOTE: LOCK DETAIL
SIMILAR EXCEPT USE
M16 GALV. MACHINED
BOLT WITH GALV. CUT
WASHER & GALV. HEX
NUTS INSTEAD OF
WELDED STUD BOLT.

HINGE DETAIL
(HINGED AREA OPENS
FOR CLEANOUT)



MULTIPLE INSTALLATION JOINT

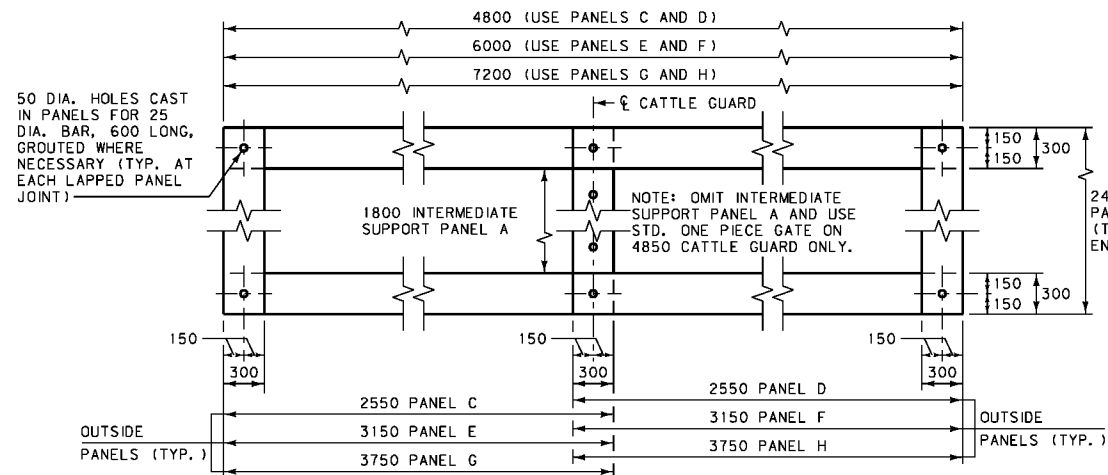
ALL DIMENSIONS ARE MILLIMETERS
(mm) UNLESS OTHERWISE NOTED.

DETAILED DRAWING	
REFERENCE	DWG. NO.
STANDARD SPEC.	611-05
SECTION 611	

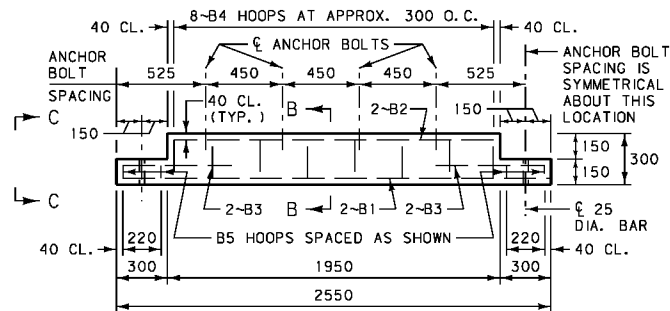
CAST-IN-PLACE CATTLE GUARD DETAILS

EFFECTIVE: AUGUST 1999

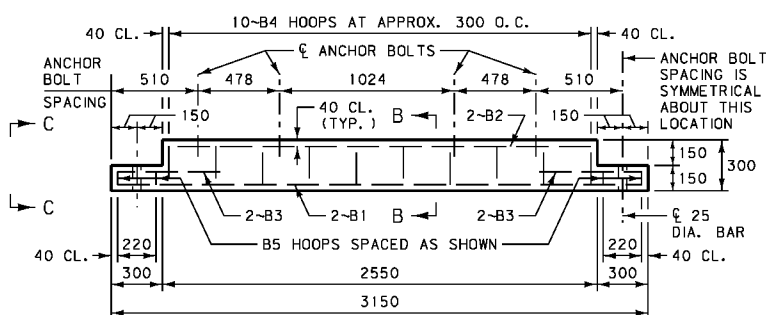




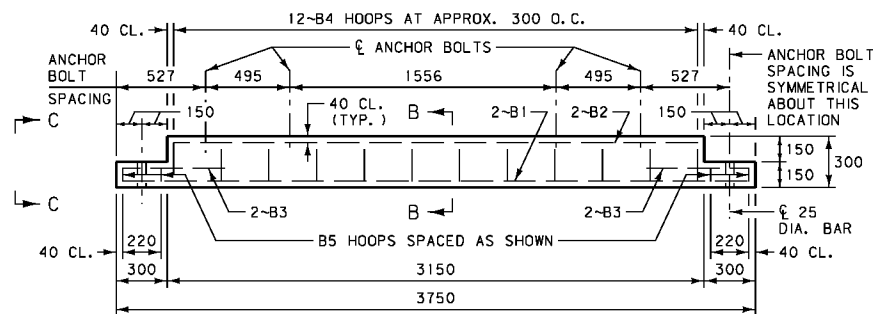
TYPICAL PLAN VIEW



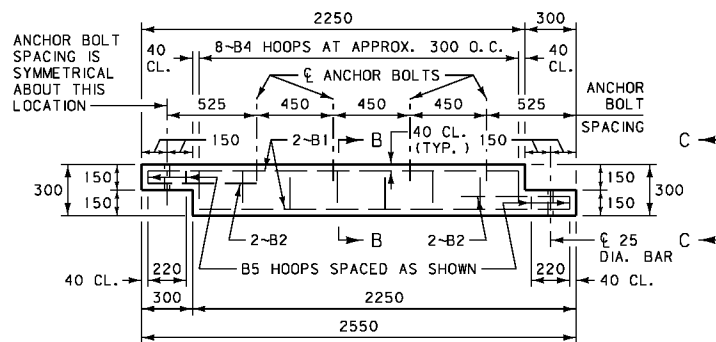
PANEL C ELEVATION



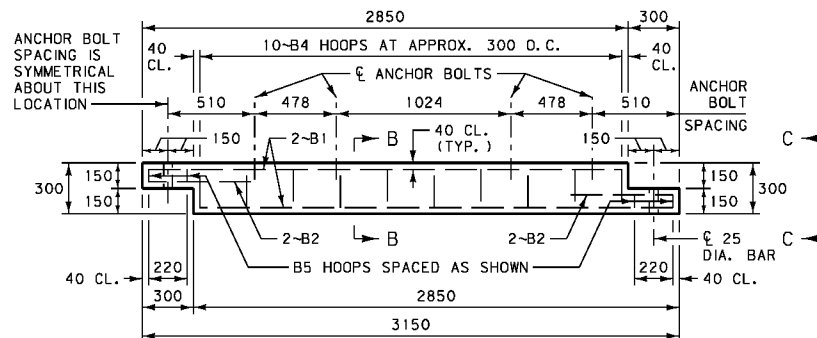
PANEL E ELEVATION



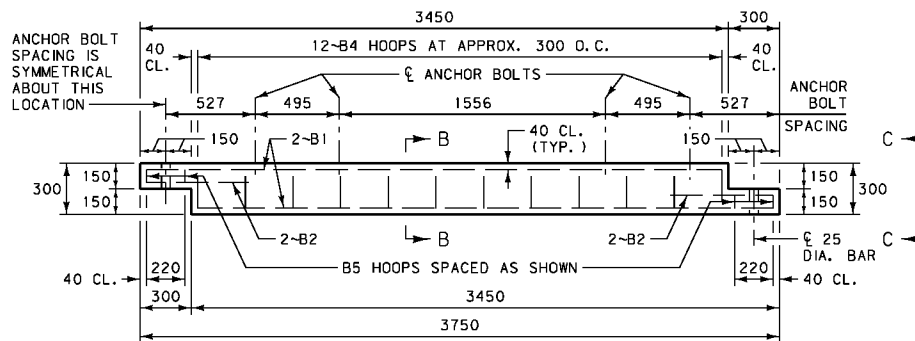
PANEL G ELEVATION



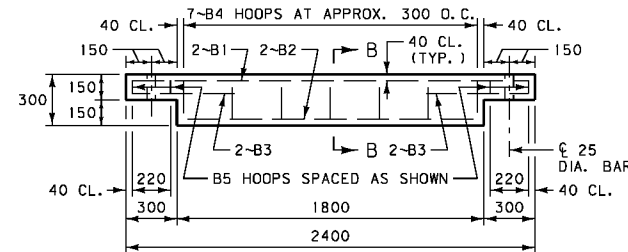
PANEL D ELEVATION



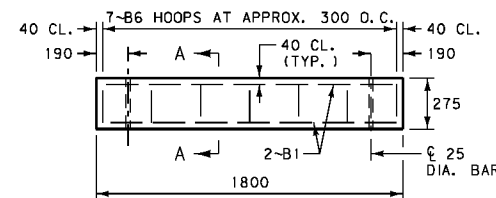
PANEL F ELEVATION



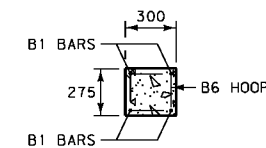
PANEL H ELEVATION



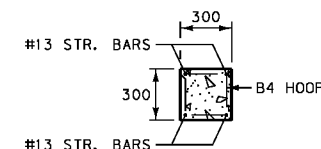
END PANEL B ELEVATION



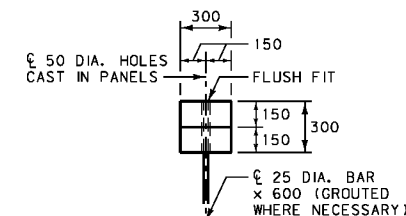
INTERMEDIATE SUPPORT PANEL A ELEVATION



SECTION A-A



SECTION B-B



VIEW C-C
(TYP. LAPPED PANEL JOINT)

NOTE:
FOR DETAILS OF STEEL GRATES
AND STEEL WINGS SEE DTL. DWG.
NO. 611-00 AND 611-05.

BILL OF REINFORCING STEEL *				
STRAIGHT BARS & BENT BARS (ALL DIMENSIONS OUT TO OUT)				
MARK	SIZE	NO.	TYPE	LENGTH
1800 SECTION - PANEL A				
B1	#13	4	STRAIGHT	1720
B6	#10	7	2	950
ESTIMATED WT. = 10.6 kg				
2400 SECTION - PANEL B				
B1	#13	2	STRAIGHT	2320
B2	#13	2	STRAIGHT	1720
B3	#13	4	STRAIGHT	650
B4	#10	7	1	1000
B5	#10	4	3	700
ESTIMATED WT. = 16.1 kg				
2550 SECTION - PANEL C				
B1	#13	2	STRAIGHT	2470
B2	#13	2	STRAIGHT	1870
B3	#13	4	STRAIGHT	650
B4	#10	8	1	1000
B5	#10	4	3	700
ESTIMATED WT. = 17.3 kg				
2550 SECTION - PANEL D				
B1	#13	4	STRAIGHT	2170
B2	#13	4	STRAIGHT	650
B4	#10	8	1	1000
B5	#10	4	3	700
ESTIMATED WT. = 17.3 kg				
3150 SECTION - PANEL E				
B1	#13	2	STRAIGHT	3070
B2	#13	2	STRAIGHT	2470
B3	#13	4	STRAIGHT	650
B4	#10	10	1	1000
B5	#10	4	3	700
ESTIMATED WT. = 20.8 kg				
3150 SECTION - PANEL F				
B1	#13	4	STRAIGHT	2770
B2	#13	4	STRAIGHT	650
B4	#10	10	1	1000
B5	#10	4	3	700
ESTIMATED WT. = 20.8 kg				
3750 SECTION - PANEL G				
B1	#13	2	STRAIGHT	3670
B2	#13	2	STRAIGHT	3070
B3	#13	4	STRAIGHT	650
B4	#10	12	1	1000
B5	#10	4	3	700
ESTIMATED WT. = 24.3 kg				
3750 SECTION - PANEL H				
B1	#13	4	STRAIGHT	3370
B2	#13	4	STRAIGHT	650
B4	#10	12	1	1000
B5	#10	4	3	700
ESTIMATED WT. = 24.3 kg				

* FOR ONE PANEL ONLY

ESTIMATED CLASS "D" CONCRETE QUANTITIES	
1800 SECTION - PANEL A	= 0.15 m ³
2400 SECTION - PANEL B	= 0.19 m ³
2550 SECTION - PANEL C	= 0.20 m ³
2550 SECTION - PANEL D	= 0.20 m ³
3150 SECTION - PANEL E	= 0.26 m ³
3150 SECTION - PANEL F	= 0.26 m ³
3750 SECTION - PANEL G	= 0.31 m ³
3750 SECTION - PANEL H	= 0.31 m ³

DETAILED DRAWING	
REFERENCE	DWG. NO.
STANDARD SPEC.	611-10
SECTION 611	
PRECAST CONCRETE BASE FOR CATTLE GUARD	
EFFECTIVE: AUGUST 1999	
MONTANA DEPARTMENT OF TRANSPORTATION	MONTANA CADD

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(mm) UNLESS OTHERWISE NOTED.